

Application for:

Revised Locally Adopted Energy Standards by the City of Culver City
Building Safety Division

Establishing a mandatory Culver City Green Building Program
requiring new development projects and major remodel projects
49,999 square feet and smaller to comply with 80% of a list of 25
applicable energy efficiency measures and requiring new
development projects and major remodel projects 50,000 square feet
and larger to comply with a LEED (Leadership in Energy and
Environmental Design) Certified performance level in Accordance
with Section 10-106 of the California Code of Regulations, Title 24,
Part 1

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Executive Summary

The City of Culver City Building Safety Division has researched and reviewed the feasibility and cost effectiveness of building permit applicants exceeding the performance requirements of the 2005 Energy Efficiency Standards.

The current and projected staffing level of the Culver City Building Safety Division will not support an additional energy efficiency program which requires a large amount of additional plan check staff time or additional field inspection staff time. The existing Building Safety Division staff will be able to implement and manage this proposed Culver City Green Building Program.

The proposed Culver City Green Building Program is proposed to be in addition to and work in conjunction with the previously approved California Energy Commission June 20th, 2007 Culver City Locally Adopted Energy Standard (Culver City Mandatory Solar Photovoltaic Requirement/ included as attachment #1 to this document).

Having established local energy efficiency criteria contained in the language of draft Resolution #_____ (included as attachment #2 to this document). The City would like to implement its resolution at the earliest convenient date following approval by the California Energy Commission.

As stated in the resolution application, the proposed local energy efficiency standards and implementation have been designed with several key criteria in mind. These include:

- Consistency with the structure, format, and calculation methods of the 2005 Title 24 Energy Efficiency Standards;
- Simplicity and clarity for Building Safety Division enforcement for both energy plan review and field inspection;
- Meeting the local energy compliance requirements as defined by the resolution which exceed the 2005 Title 24 standards; and;
- The provision of flexibility by allowing construction permit applicants to meet the new requirement by one or more design approaches:(a) for new development projects and major remodel projects 49,999 square feet and smaller to comply with 80% of a list of 25 applicable energy efficiency measures and new development projects and major remodel projects 50,000 square feet and larger to comply with a LEED (Leadership in Energy and Environmental Design) Certified performance level.

This application to the California Energy Commission conforms to the requirements laid out in Section 10-106 of the California Code of Regulations,

Title 24, Part 1, *LOCALLY ADOPTED ENERGY STANDARDS*. The proposed Culver City resolution shall take effect only after the Commission has reviewed and formally approved the proposed local energy standards as meeting all requirements of Section 10-106.

Statement per Section 10-106(b)3.

The proposed resolution requires that all new commercial and multifamily residential construction shall be designed to consume no more TDV energy than permitted by Title 24, Part 6.

The main features of the proposed resolution are that:

1. New commercial or multifamily construction shall be required to install 1kw of solar photovoltaic power per each new 10,000 square feet of construction, or fraction thereof.
2. If the geometry of the new project doesn't permit compliance with the requirement, the construction permit applicant may pay an equivalent amount into a City fund to pay for solar systems on City facilities or other local non-profit entities.
3. This requirement will reduce the demand for offsite electricity for new commercial and multifamily buildings in Culver City.
4. It is expected that builders will consider enlarging the photovoltaic systems beyond the 1kW requirement,

With respect to any technical questions concerning the development, methodology, descriptions, or implementation outlined in this application, please contact Craig Johnson at Culver City Building Safety.

Ordinance Summary

The City of Culver City developed a *Green Building Program and Requirements Ordinance* ("Ordinance") to conserve natural resources through sustainable design and construction practices.

The Ordinance has been designed with multiple considerations. These include:

- Consistency with the currently adopted methods of the 2005 Title 24 Building Energy Efficiency Standards.
- All Green Building measures are in addition to the 2005 Title 24 Building Energy Efficiency Standards which remain in full effect until August 1st, 2009, when the 2008 Building Energy Efficiency Standards go into effect.
- Enforcement, support, and Training: The Culver City Building Safety Division staff hold many ICC Certifications and stay up to date on all latest training from many sources including the California Energy Commission, The International Code Council, the California Building Officials, and other regional training opportunities.
- The City of Culver City understands the Ordinance will need to be resubmitted to the California Energy Commission for approval using the 2008 Building Energy Efficiency Standards which become effective August 1st, 2009.

Proposed Culver City Green Building Program:

1. Category 1 Qualifying Projects:

All new buildings of 49,999 square feet or less of gross floor area and major renovations to existing buildings of 49,999 square feet or less of gross floor area, shall comply with 80% of applicable items from a list of 25 energy efficiency and green building items, excluding one and two family residential projects.

2. Category 2 Qualifying Projects:

All new buildings of 50,000 square feet or more of gross floor area and major renovations to existing buildings of 50,000 square feet or more of gross floor area, shall comply with a LEED Certified performance level.

3. Urban Tree Requirements: *(Not directly applicable to the CEC; included as additional information.)*

When feasible, all existing on-site and existing street trees with a trunk diameter of 2" or greater shall be preserved or replaced with trees of comparable size.

4. Green Zone Incentive Program: *(not directly applicable to the CEC; included as additional information.)*

Plan check fees up to \$5,000 per permit may be waived for Category 1 and Category 2 qualifying projects which are located in the Culver City AIP (Redevelopment Area Improvement Plan) area on West Washington Blvd. in Culver City.

Impacts of the New Ordinance

The energy performance impacts of the Ordinance has been evaluated using case studies which reflect the range of projects which the Ordinance may commonly apply to:

- A new 4-unit multifamily project; 5,832 square feet total living area, 2 story
- A new commercial building project; 4,257 square feet, 2 story

A New 4-unit multifamily project

The prototype residential building is a 2 story structure, each of 4 residential units is a 2 story unit, all units are over a subterranean parking garage, fitting on a typical Culver City 6,750 square foot R3 zoned lot.

The overall building is a prototype that complies with the Culver City multifamily design guidelines currently being developed.

Each residential unit has approximately 729 square feet of living area per floor, 1,458 square feet of total living area.

The prototype residential building is a wood framed structure over a concrete subterranean parking garage.

A new 4-unit multifamily project: Base

- 22% total fenestration area
- 4 HVAC systems
- 80% AFUE furnaces
- 13 SEER air conditioning
- R- 4.2 duct insulation
- No HERS measures
- R-19 floors
- R-13 exterior walls
- R-30 roof/ ceiling
- Non-metallic fenestration: .40 U-factor and .35 SHGC
- 50 gallon DHW, .57 EF, non-recirculating

A new 4-unit multifamily project: Culver City Green Building Program Category 1 Estimated 15% improvement over base Title 24

- 22% total fenestration area
- 4 HVAC systems
- 93% AFUE furnaces
- 17 SEER air conditioning
- ducts within the heated and cooled space
- No HERS measures
- R-38 floors
- R-28 exterior walls

- R-38 roof/ ceiling
- Non-metallic fenestration: .39 U-factor and .30 SHGC
- Tankless water heaters
- Radiant barriers under roof sheathing
- Exterior shading over east, south, and west glass
- All lighting fluorescent, LED, or other high efficiency

A new commercial building project, 4,257 square feet, 2 story

The prototype commercial building is a two story structure; approximately 2,125 square feet per floor.

The prototype commercial building is similar to recently constructed building in Culver City, fitting on a typical 7,200 square foot commercially zoned lot.

The prototype commercial building is a wood framed, slab on grade structure, with surface parking at the rear of the lot.

A new commercial building project: Base

- 25% total fenestration area
- 2 HVAC systems
- 80% AFUE furnaces
- 13 SEER air conditioning
- R- 4.2 duct insulation
- No HERS measures
- R-19 floors
- R-13 exterior walls
- R-30 roof/ ceiling
- Non-metallic fenestration: .40 U-factor and .35 SHGC
- small instantaneous tankless electric water heating for the restrooms

A new commercial building project: Culver City Green Building Program Category

1

Estimated 15% improvement over base Title 24

- 25% total fenestration area
- 2 HVAC systems
- 93% AFUE furnaces
- 17 SEER air conditioning
- ducts within the heated and cooled space
- No HERS measures
- R-38 floors
- R-28 exterior walls
- R-38 roof/ ceiling
- Non-metallic fenestration: .39 U-factor and .30 SHGC
- Tankless gas water heaters
- Radiant barriers under roof sheathing

- Exterior shading over east, south, and west glass
- All lighting fluorescent, LED, or other high efficiency

Summary of Measures and Cost Analysis

Summary and Cost of Proposed energy Efficiency Measures assumed for Analysis

Project	Energy Efficiency Measure	Estimated Cost
New 4-Unit Multifamily Project, 5,832 sq. ft., 2 Story	▪ Upgraded efficiency of the furnaces; 4 x \$200 each.	\$800
	▪ Upgraded SEER of the air conditioning: 4 x \$250 each.	\$1,000
	▪ Ducts within the heated and cooled space: \$800	\$800
	▪ Upgrade fenestration U and SHGC value: \$1,400	\$1,400
	▪ Upgraded insulation: \$1,800	\$1,800
		Total: \$5,800
New Commercial Project, 4,257 sq. ft., 2 Story	▪ Upgraded efficiency of the furnaces; 2 x \$200 each.	\$400
	▪ Upgraded SEER of the air conditioning: 2 x \$250 each.	\$500
	▪ Ducts within the heated and cooled space: \$800	\$800
	▪ Upgrade fenestration U and SHGC value: \$1,200	\$1,200
	▪ Upgraded insulation: \$1,600	\$1,600
		Total: 4,500

Design and Modeling Criteria:

Each buildings orientation, design, and installed components used to gain compliance with Title 24, Part 6 as well as the Ordinance may vary greatly. This report does not reflect all energy efficiency measures that can be utilized to gain compliance with the Ordinance.

Cost Effectiveness of the Ordinance

The cost effectiveness of the increased energy efficiency required by the Ordinance is calculated for the buildings analyzed above. The total cost to meet the measures needed to meet the ordinance is divided by the annual energy savings to determine the cost effectiveness of the additional energy efficiency measures.

An average residential utility rate of \$0.19 kWh for electricity and \$1.77 for natural gas and an average commercial utility rate of \$0.16 kWh for electricity and \$1.55 for natural gas were used for the purposes of this study.

Yearly energy and cost savings from the Ordinance.

Project	Estimated cost of construction	Electricity savings (kWh/yr)	Nat. gas savings (therms/yr)	Electricity cost savings	Nat. gas cost savings	Total yearly cost savings
5,832 sq. ft. 4-unit resid. project	\$1,049,760 (\$180/ sq. ft. estim.)	751	147	\$143	\$260	\$403
4,257 sq. ft. comm. project	\$723,690 (\$170/ sq. ft. estim.)	5,172	791	\$828	\$1,226	\$2,054

Simple payback for modeled energy efficiency measures for Ordinance compliance.

Project	Additional cost of energy efficient measures	Annual energy cost savings	Simple payback (years)
5,832 sq. ft. 4-unit residential project	\$5,800	\$403	14.39
4,257 sq. ft. commercial project	\$4,500	\$2,054	2.19

Implementation Plan

The proposed Culver City Green Building Program would only apply to the significant commercial and multifamily residential construction projects in Culver City.

Culver City is approximately 98% built out. There are approximately 2,400 construction permits, including plumbing, electrical, and mechanical permits, issued in a typical year in Culver City. The vast majority of them are for small residential or small commercial remodel and/ or addition projects.

The proposed Culver City Green Building program would apply to approximately 24- 36 projects per year, obviously varying each year.

All qualifying projects applying for construction permits will again be informed of the requirement at the time of permit application.

All projects the proposed Culver City Green Building Program applies to that apply for construction permits would be required to supply the standard energy forms and information on the plans indicating compliance with the 2005 California Energy Efficiency Standards. There will be no changes to the energy forms or the field inspection of qualifying projects, other than the plan review and field inspections of the required green building measures.

For Category 2 projects requiring a LEED Certified performance level; prior to the issuance of a building permit, the applicant must demonstrate that a LEED AP is a member of the design team, must demonstrate that the project has been registered with the USGBC's LEED program, must provide a copy of the completed LEED checklist submitted to the USGBC LEED program, must provide a signed declaration from the project LEED AP stating the plans have been reviewed and the plans meet the intent of a LEED Certified level or higher, and the project shall comply with a .3 point margin of error for a LEED Certified performance level.

Required green building measures will be field inspected concurrently with the overall building construction. The overall building construction will not receive a final inspection nor will it receive a certificate of occupancy until all building systems, including all green building measures, are completed and operating.